UNITED STATES PATENT AND TRADEMARK OFFICE

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10/751,530	01/06/2004	Junichi Komagata	SON-2895	3306

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EXAMINER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on _23 April 2009_.

2a) ☒ This action is **FINAL**.   2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) _1,3,4,6 and 15-26_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) _1,3,4,6 and 15-26_ is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some * c) ☐ None of:

        1. ☐ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____.

        3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

- A request for continued examination under 37 CFR 1.114, including the fee

  set forth in 37 CFR 1.17(e), was filed in this application after final rejection.

  Since this application is eligible for continued examination under 37 CFR

  1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the

  finality of the previous Office action has been withdrawn pursuant to 37 CFR

  1.114. Applicant's submission filed on 4/23/2009 has been entered.

- Claims 1, 4, and 6 have been amended.

- Claims 15-26 have been added.

- Claims 1, 3, 4, 6, and 15-26 are now pending.

Claim Rejections - 35 USC § 101

1.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of
> matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the
> conditions and requirements of this title.

Claims 4, 6, 16, and 22-26 are rejected under 35 U.S.C. 101 as not falling within

one of the four statutory categories of invention. While the claims recite a series of

steps or acts to be performed, a statutory "process" under 35 U.S.C. 101 must (1) be

tied to particular machine, or (2) transform underlying subject matter (such as an article

or material) to a different state or thing. See page 10 of In Re Bilski 88 USPQ2d 1385.

The instant claims are neither positively tied to **a particular machine** that accomplishes

the claimed method steps nor transform underlying subject matter, and therefore do not

qualify as a statutory process.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3.   Claims 1, 4, 17, 18, 22, and 23 are rejected under 35 U.S.C. 102(e) as being

anticipated by U. S. Patent No. 6,560,230 B1 ("Li").

Regarding claims 1, 4, 17, 18, 22, and 23,

Li shows in fig. 5A a storing portion 55 for storing first packets that compose the

real time streams (fig. 4, voice 40) and second packets that compose the non-real time

stream (fig. 4, HTTP 48 and other 46) so that a first-in-first-out operation is respectively

performed for every stream (**col. 8, lines 47-48**, *Queues 55 are logical first in, first out*

*("**FIFO**") queues*); and a counter portion for counting (**col. 4, lines 39-40**, *a **counter** for*

maintaining a virtual time for the scheduling engine; **col.10, lines 42-51**, *While S, F*

and V have been called "times" these parameters do not necessarily bear any

*relationship to actual time. S, F and **V are similar to time in that they always***

***increase**. In commercial embodiments, S F and V will typically be values stored in*

*memory locations. **The values are periodically added to by scheduler 50**) a*

predetermined time interval between transmission times (**col. 10, lines 1-5**, *If a packet*

51 of length L were transmitted at a rate R, its transmission will be completed after an

interval I given by: I=L/R) of the first packets for every said real time stream; and a

scheduler portion for transmitting the first packets stored for every said real time stream

in the storing portion after every said predetermined time interval (**col. 4, lines 39-49**, *a*

scheduling engine adapted to select one packet from a plurality of packets at the

heads of the queues; **col. 10, lines 42-45**, *Scheduler 50 keeps a record of V for each*

scheduling engine 60 and also keeps records of S and F for the packets at the head of

each non-empty queue 55 managed by scheduler 50), calculating a transmission end

time of the first packets from the predetermined time interval and the transmission times

of the first packets of each of the real time streams for every said real time stream,

transmitting a first packet whose transmission end time is the earliest in the first packets

when the transmission times of the first packets overlap (**col. 11, lines 46-48**, *A*

simplified method is possible whereby leaf scheduling engine 60 simply selects for

*transmission the packet which has the **smallest finish time F;** **col. 13, lines 35-44**, *The*

method continues by passing the one high priority packet having the smallest finish time

F (fig. 8, step 206), and transmitting the second packets when the predetermined time

interval between transmissions of said first packets are longer than the transmission

times of the second packets (**col. 15, lines 22-29**, *When a parent scheduling engine 60*

*selects a packet from one of its child scheduling engines 60, **it initially considers only***

the highest priority packets being held** by the child scheduling engines 60. **If none

of those packets are eligible, it considers the next highest priority packets being

***held by the child scheduling engines 60;** col. 11, lines 17-25, When this eligibility*

criterion is used, the eligible packets are packets whose predicted start times have

passed. If the scheduling engine 60 does not send a packet 51 from that queue 55

soon, the queue 55 will not have the benefit of the bandwidth calculated by equation (1).

If a packet 51 at the head of a queue 55 is not eligible, its start time is greater than

the virtual time V of the scheduling engine 60. *This indicates that the queue 55 has*

already received the benefit of its assigned bandwidth; **col. 10, lines 14-24**, *The*

packets in a queue 55 associated with a leaf class of tree 39 should ideally be

transmitted out of the queue 55 at the rate given by Equation (1). In a preferred

implementation of scheduler 50, each leaf scheduling engine 60 calculates a start time

S and a finish time F for packets 51 at the heads of its queues 55 (step 106). ***The start***

and finish times for a packet *can be considered to be measures of when a packet 51*

at the head of a queue 55 should ideally start to be transmitted and when it should finish

transmission. S and F are used by leaf scheduling engines 60 to select which packet to

transmit next).

In addition for claim 17, Li shows in fig. 5 buffer portion 55 which stores first

packets. perform FIFO operations (col. 8, lines 47-48), scheduler 50 (col. 4, lines 36-49

and col. 10, lines 14-24), which comprises a counter (col. 4, lines 39-40), a calculator

(col. 4, lines 34-35, *means for keeping a start time, a finish time and a priority for a*

packet at a head of each of the queues), and a transmitter 58 (col. 8 lines 54-60)(see at

least col. 4, lines 28-51, col. 8, lines 26-60).

Regarding claims 15, 16, 21, and 26,

Li discloses that in the preferred embodiment of the invention, a notion of time is used to measure whether packets are being transmitted at an assigned rate. If a packet 51 of length L were transmitted at a rate R, its transmission will be completed after an interval I given by: (1) $I=L/R$ (2), and that each scheduling engine 60 <u>maintains a virtual time V</u> which advances by the interval I each time it passes a packet to its parent scheduling engine (or to forwarder 58 in the case of scheduling engine 60C). Each interval is calculated from the length of the packet being passed. Note that if the length of the packets are the same while the rate is kept at a constant R, the interval I would also be kept constant as claimed.

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5.   Claims 3, 6, 20, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li in view of U.S. Patent No. 5,539,729 ("Bodnar").

Regarding claims 3, 6, 20, and 25,

LI discloses that when a parent scheduling engine 60 selects a packet from one of its child scheduling engines 60, it initially considers only the highest priority packets

being held by the child scheduling engines 60. If none of those packets are eligible, it

considers the next highest priority packets being held by the child scheduling engines

60. The parent scheduling engine 60 continues checking for packets of ever lower

priority until it finds an eligible packet. *If no eligible packets are found, but the child*

scheduling engines 60 are holding on to one or more packets, **the virtual time of the**

parent scheduling engine 60 is advanced to the earliest start time *of those packets*

being held (claimed a scheduler portion is configured to treat times shorter than the

transmission times of the second packets as new transmission times of the second

packets)(see col. 15, lines 22-34).

Li does not disclose that this step occurs when the second packets are not

transmitted while a predetermined number of the first packets are transmitted.

Bodnar discloses that a counter is associated with the higher priority packet

stream, so that **when the counter reaches a predetermined number, the higher**

priority packet stream is disabled, **so that the lower priority packet stream may be**

processed. Advantageously, the counter may be set to a predetermined value and

then decremented, so that when the counter reaches zero, the higher priority packet

stream is disabled. Advantageously, a predetermined number of lower priority packets

are processed before processing is re-enabled on the higher priority packet system and

the counter reset. Advantageously, when the higher priority packet stream is interrupt-

driven, interrupts are disabled and then enabled after a predetermined number of

packets are processed from the lower priority stream (see col. 3, lines 9-27).

It would have been *prima facie* obvious to one of ordinary skill in the art at the

time of the invention was made to modify the reverse packet scheduling method of Li to

use a counter to limit processing of high priority packet stream in order to process lower

priority packet stream as taught by Bodnar. One skilled in the art would have been

motivated to make the combination in order to transmit "real time" packets with very

small delays but which can also schedule the transmission of non-real time packets

fairly (see Li, col. 3, lines 50-53).

6.   Claims 19 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Li in view of Pub. No. US 2003/0119556 A1 ("Khan").

        Regarding claims 19 and 24,

        Li does not disclose treating packets of non-real time stream as if their

transmission times were shorter when packets of non-real-time streams are not

transmitted after a predetermined time has elapsed.

        Khan discloses that lower priority packets may be immediately "promoted" and

sent after a predetermined time period has passed even though other higher priority

packets are waiting transmission in higher priority sub-queues (para. 22).

        It would have been *prima facie* obvious to one of ordinary skill in the art at the

time of the invention was made to modify the reverse packet scheduling method of Li to

immediately promote lower priority packets after a predetermined time period has

passed as taught by Khan. One skilled in the art would have been motivated to make

the combination in order to transmit "real time" packets with very small delays but which

can also schedule the transmission of non-real time packets <u>fairly</u> (see Li, col. 3, lines 50-53).

Response to Arguments

7.   Applicant's arguments filed 4/23/2009 have been fully considered but they are not persuasive.

-       The applicant argues on pg. 9 of Remarks that Li does not disclose or

        suggest *"a counter portion for counting a predetermined time interval*

        between transmissions times of the first packets for every said real time

        stream, a scheduler portion for transmitting the first packets stored for every

        said real time stream in the storing portion after every said predetermined

        time interval, and transmitting the second packets when the predetermined

        time interval between transmissions of said first packets are longer than the

        transmission times of the second packets."

-       The examiner respectfully disagrees.   Initially, note that Li states that the

        basis for his invention is that there is a need for a fast scheduling method and

        apparatus which can transmit <u>"real time" packets</u> with very small delays but

        which can also schedule the transmission of <u>non-real time packets fairly</u> (col.

        3, lines 50-53).   Li discloses a **counter** *for maintaining a virtual time for the*

        scheduling engine (col. 4, lines 39-40) while clarifying that *while S, F and V*

        have been called "times" these parameters do not necessarily bear any

relationship to actual time [and that] S, F and <u>V are similar to time in that they</u>

<u>always increase</u> (claimed counter; col. 10, lines 42-51). Li further discloses

that *if a packet 51 of length L were transmitted at a rate R, its **transmission***

***will be completed after an interval I** given by: I=L/R* (col. 10, lines 1-5).

Li further discloses a **scheduler** *50 [that] keeps a record of V for each*

scheduling engine 60 and also keeps records of S and F for the packets at

the head of each non-empty queue 55 managed by scheduler 50 (col. 10,

lines 42-45). Li still further discloses that *[w]hen a parent scheduling engine*

*60 selects a packet from one of its child scheduling engines 60, **it initially***

***considers only the highest priority packets being held** by the child*

*scheduling engines 60. **If none of those packets are eligible, it considers***

the next highest priority packets being held by the child scheduling

engines 60 (col. 15, lines 22-29). Li explains that *[w]hen this eligibility*

criterion is used, the eligible packets are packets whose predicted start times

*have passed. If the scheduling engine 60 does not **send** a packet 51 from*

that queue 55 soon, the queue 55 will not have the benefit of the bandwidth

*calculated by equation (1). **If a packet 51 at the head of a queue 55 is not***

eligible, its start time is greater than the virtual time V of the scheduling

engine 60. *This indicates that the queue 55 has already received the benefit*

of its assigned bandwidth (col. 11, lines 17-25).

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to ANTHONY SOL whose telephone number is (571)272-

5949. The examiner can normally be reached on M-F 7:30am - 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Jay Patel can be reached on (571) 272-2988. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

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you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

/Anthony Sol/

Examiner, Art Unit 2419

7/5/2009